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RECOMMENDATION FOR
POLARITY OF EARTH CONNECTIONS AND
MARKING OF ELECTRICAL EQUIPMENT
FOR AUTOMOBILES

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RECOMMENDATION FOR POLARITY OF EARTH CONNECTIONS AND MARKING OF ELECTRICAL EQUIPMENT FOR AUTOMOBILES

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(Continued on page 2)

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IS: 7471 - 1974

(Continued from page 1)

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Indian Standard
RECOMMENDATION FOR
POLARITY OF EARTH CONNECTIONS AND
MARKING OF ELECTRICAL EQUIPMENT
FOR AUTOMOBILES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 2 August 1974, after the draft finalized by the Automobile Electrical Equipment Sectional Committee had been approved by the Electro-technical Division Council.

0.2 This standard refers to electrical installations on automobiles having an earth return system.

0.3 All vehicle manufacturers in this country, with one or two exceptions, have been used to positive battery earthing. Meanwhile, the rest of the world's automobile manufacturers retained or changed to negative earth. Technical developments over this period, such as the introduction of semiconductor and electronic components in vehicle electrical equipment have eliminated any advantages that positive earthing may have had over negative earthing. This standard has been prepared in keeping with the trend of world-wide standardization.

1. SCOPE

1.1 This standard specifies the system of earthing and marking of electrical equipment for automobiles having an earth return system.

2. EARTHING

2.1 Negative Earthing of Battery — Negative earthing shall be the recommended practice for the automobiles having earth return system.

3. IDENTIFICATION OF COMPONENTS

3.1 When an automobile manufacturer introduces a change from positive to negative earth, it will be necessary to identify electrical components affected, to avoid incorrect fitting in assembly and service, and to clearly mark the automobile itself.

3.2 It is important that standard means of component identification are used and understood, particularly in service.

3.2.1 The marking of components for negative earth system shall be as given in Table 1.

TABLE 1 POLARITY MARKING OF ELECTRICAL EQUIPMENT FOR AUTOMOBILES USING NEGATIVE EARTH SYSTEM

SL No.	TYPE OF EQUIPMENT	POLARITY MARKING	REMARKS
(1)	(2)	(3)	(4)
i)	dc generator	Main terminal identification: a) Red and/or '+' for main (armature) terminal b) Black or '-' for earth terminal	
ii)	dc generator control unit	Not marked	Suitable for either polarity
iii)	dc generator control unit incorporating semiconductor device	Cover marked '-' earth	
iv)	Alternator	Main terminal identification: a) Red and/or '+' for positive supply b) Black and/or '-' for earth terminal	
v)	Alternator unit control	'+' and '-' marked on the cover	Correct connection to unit ensured by inhibited connector
vi)	*Ignition coil	'+' and '-' moulded on the cover	Terminal variation as required by automobile manufacturers
vii)	Permanent magnet motors	Not marked	Correct connections to unit ensured by inhibited connectors which are marked appropriately
viii)	Fuel gauge	Marked '-' earth	
ix)	Ammeters	Not marked	Connect as necessary
x)	Batteries	'+' and '-'	
xi)	Clocks, electrical speedometer, electrical tachometer, radio	Where appropriate '+' or '-'	

*In the negative earth system internal connections of ignition coils should be such that when negative of the primary winding is connected to contact breaker of distributors, high tension terminal of ignition coil will be at negative potential. The only advantage of positive earthing for ignition voltage is longer spark plug life and it reduces the break-down voltage.

3.2.2 The marking of components for positive earth system shall be as given in Table 2.

NOTE 1 — Table 2 provides polarity marking for electrical equipment using positive earth system only for replacement market.

NOTE 2 — Normally the same regulator may be applied for both systems. However, if any regulator is unsuitable for any particular system, it should be marked separately.

TABLE 2 POLARITY MARKING OF ELECTRICAL EQUIPMENT FOR AUTOMOBILES USING POSITIVE EARTH RETURN SYSTEM

Sl. No.	TYPE OF EQUIPMENT	POLARITY MARKING	REMARKS
(1)	(2)	(3)	(4)
i)	dc generator	Main terminal identification: a) Black and/or '—' for main (armature) terminal b) Red or '+' for earth terminal	
ii)	dc generator control unit	Not marked	Suitable for either polarity
iii)	dc generator control unit incorporating semiconductor device	Cover marked '+' earth	
iv)	Alternator	Main terminal identification: a) Black and/or '—' for negative supply b) Red and/or '+' for earth terminal	
v)	Alternator control unit	'+' and '—' marked on the cover	Correct connection to unit ensured by inhibited connector
vi)	Ignition coil	'+' and '—' moulded on the cover	Terminal variation as required by automobile manufacturers
vii)	Permanent magnet motors	Not marked	Correct connections to unit ensured by inhibited connectors which are marked appropriately
viii)	Fuel gauge	Marked '+' earth	
ix)	Ammeter	Not marked	Connect as necessary
x)	Batteries	'+' and '—'	
xi)	Clocks, electrical speedometer, electrical tachometer and radio	Where appropriate '+' or '—'	

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ON
AUTOMOBILE ELECTRICAL EQUIPMENT

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- 1060-1963 Methods of test for sparking plugs (*revised*)
- 1063-1963 14-mm sparking plugs (*revised*)
- 1884-1970 Automobile electric horns (*first revision*)
- 2077-1962 Automobile electric horn relays
- 2081-1962 Taper terminal cable connectors for automobile batteries
- 2325-1963 Ignition coils
- 2577-1963 Cartridge fuse links for automobiles
- 2646-1964 Generators (dynamos) for automobiles
- 3105-1966 General requirements for automobile lighting and signalling devices
- 3141-1965 Starters for automobiles
- 3563-1966 Automobile headlights (replaceable bulb type)
- 3628-1966 Sidelights, tail-lights, parking lights, stop lights and direction indicators for automobile use
- 4050-1967 Methods of tests for horn switches for automobiles
- 4060-1967 Flashers for direction indicators for automobiles
- 4061-1967 Headlight switches for automobiles
- 4062-1967 Foot-operated headlight dip switches for automobiles
- 4063-1967 Fuse box for automobiles
- 4086-1967 Methods of test for distributors
- 4362-1967 Recommendation for lighting of number plates for automobiles
- 4370-1967 Code of practice for the use of lighting and signalling devices on cars and commercial vehicles
- 4373-1967 Hydraulically operated stop light switches for automobiles
- 4815-1968 Self-cancelling direction indicator switches for automobiles
- 5439-1969 Oil pressure switches for automobiles
- 5545-1969 Fog lights for automobiles
- 4546-1970 Distributor caps for automobiles
- 5562-1970 Fuel gauges for automobiles
- 5577-1970 Ammeters for automobiles
- 5577-1971 Regulators for automobile dc generators (dynamos)

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